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EXAMINER	
AFTERGUT, JEFF H	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/684,762	Applicant(s) ASHTON ET AL.
	Examiner Jeff H. Aftergut	Art Unit 1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2007*.
2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 4-16* is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1, 4-16* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☐ All b)☐ Some * c)☐ None of:
1.☐ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 and 4-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In each of the independent claims, the claim initially recites that the filament band is wound onto the rotating mandrel " at least at two distinct, user-defined winding angles within at least one of the winding passes" and then states "wherein the at least one filament band is laid out on the mandrel at a first angle during an initial winding pass, is changed to a second angle during at least one central winding pass, and is returned back to the first angle during a subsequent winding pass". The applicant points to page 25, lines 11-22 for support for this language. While the applicant does have support to recite that within a single winding pass there is an abrupt angle change in a central region of the same winding pass and then a reverting back to the original angle at the other side of the pass (the sides opposed to the central region having the same angle), the claim as presented does NOT state this. Instead, the claim leads to confusion as the language following the phrase "at least at two distinct, user-defined winding angles within at least one of the winding passes" appears to reference separate winding "passes" having an initial winding pass, a central winding pass, and a subsequent winding pass. It is suggested that applicant recite that the angles are all changed from the first initial portion to the central portion and then to the subsequent portion within the same winding pass. This can be done by defining the winding pass as a first winding pass by adding the language "defining a first winding pass" after the word "passes" on line 13 of claim 1. On line 14 of claim 1, after the word "initial" the language "portion of the first" should be added to make it clear that the initial angle of the pass was within the pass having the angle change therein. Likewise after the word "central" on line 15 of claim 1, it is suggested that "portion of the first" be added. Lastly, after the word "subsequent" the language "portion of the first" should be added to make it clear that the winding angle was changed within the same winding pass.

Additionally, it should be noted that the language of the claim does not positively recite that the filament band angle was abruptly changed within the pass. It is suggested that on line 19 of claim 1 that the word "when" be changed to "as" and that on line 20 after "changed" the language "within the first winding pass" be added to make it clear that the angle was in fact abruptly changed.

While these changes have been identified with respect to claim 1, it should be noted that similar language is present in the other independent claims and applicant should accordingly change these claims as well to positively recite the change of the angle within the same pass as well as the sticking of the filament band to the mandrel as the abrupt change in the angle takes place. See claims 9 and 15.

It is suggested that in each of claims 9 and 15 on lines 19 and 21, respectively, the word "strait" be changed to --straight--.

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

> art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1 and 4-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The applicant is advised that the original disclosure did not describe the use of three separate passes, an initial pass, a central pass and a subsequent pass where the initial pass and the subsequent pass had the same angle and the central pass was at a different angle. It is suggested that the applicant make the identified changes above in order to make the claim clear and concise as well as provide clear support for the invention as claimed form the original disclosure.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishihara (newly cited) in view of Futakuchi et al, Angell, Jr. and Novak.

Nishihara taught that it was known at the time the invention was made to form a perform for a composite article which included the steps of winding to form the perform wherein the angle within a single pass of the perform was changed in the central region of the pass from a first initial angle to a second different angle. Following the winding in the central region of the pass, the angle was again changed back to the initial angle in the pass. The reference taught that there was an abrupt angle change in the operation so long as the filaments being applied to the form were not liable to be moved in the operation. The reference, subsequent to the winding operation, taught that the filaments were impregnated with a resin in a molding operation. The reference clearly taught the winding operation as claimed wherein the winding angle was changed in the middle portion of a winding pass. The applicant is specifically referred to Figures 1(B), 2(B), 3(A), and 3(C).

In the art of manufacturing a perform, it was well settled as evidenced by Futakuchi et al that those versed in the art at the time the invention was made would have understood that the resin in a composite article made from a perform would have been supplied to the filaments used in the perform (where the perform was wound) with the resin either before or after the winding of the perform. The applicant is more specifically referred to column 4, lines 5-24 of the reference. Certainly, those skilled in the art at the time the invention was made would have understood that the resin would have been applied to the windings either before or after the winding operation in Nishihara and that such would have been an art recognized alternative form of processing the materials. The references did not express that the resin used in the impregnation operation was one which was solid or semi-solid at room temperature in the impregnation operation.

The reference to Angell Jr. et al suggested that those skilled in the art would have incorporated a resin which was of a hot melt type of thermosetting resin (wherein the same was applied to the fibers as a heated material) in order to eliminate concerns regarding volatiles which result in defective finished products as such included voids after cure. The reference taught that the filaments should be impregnated with a hot melt type of thermoset resin wherein no volatiles would be present and wherein one heated the resin only a limited amount in order to avoid cure of the resin therein. It should be noted that subsequent to the application of the resin to the fibers in Angell, et al, the reference taught that the resin was in a semisolid state, see column 3, lines 3-11, for example. Clearly, it would have been understood that prior to the heating step the Resin was in a semisolid condition and was reverted back to the same subsequent to cool down at ambient temperature in Angell, et al. to further evidence the same, the reference to Novak is cited.

The reference to Novak suggested that those skilled in the art would have also recognized the advantages of employing a solid or semisolid resin material to impregnate filaments therein. The reference to Novak identified the same void free manufacture as a desirable use of a solid or semisolid for the form of the resin therein, see column 1, lines 31-60. The reference clearly suggested that the resin employed was one which was heated in order to facilitate impregnation (much like Angell, et al) and that this type of resin was in a solid or semisolid state at room temperature, see column 3, lines 50-65. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a resin which was solid or semisolid at room temperature and utilize the same to impregnate the filaments in Nishihara prior to winding the same in the manufacture of a perform in accordance with the teachings of Futakuchi as such would have eliminated volatiles (solvents) and would have resulted in a finished end product which was free of voids as suggested by Angell, Jr. et al and Novak. With respect the abrupt changes in the angle, the applicant is advised that the claims as presented do not require an abrupt change (i.e. the language recites "when" rather than positively reciting an angle change). Additionally, as the reference to Nishihara suggested that those skilled in the art would have incorporated a semisolid or solid resin at room temperature in the processing (and this is the same resin defined by applicant in the processing), one skilled in the art would have expected that the resin would have responded and acted in a like manner to that of applicant's resin (namely that the resin would have maintained the filament band in place during the winding operation when there was a change in the wind angle associated with the winding operation).

7. Claims 1, 2, and 4-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 6 further taken with any one of Prochaska et al, Fischer et al, Youngkeit, Matuska or Carrow for the same reasons as expressed in paragraph 3 of the Office action dated 11-14-06.

The references to Nishihara, Futakuchi et al, Angell, Jr. et al and Novak suggested that those skilled in the art at the time the invention was made would have formed a composite material by selecting a resin which was solid or semi\-solid at room temperature (Angell and Novak), heated the resin in order to render the same viscous enough to facilitate impregnation (Angell and Novak), and impregnated filaments with the viscous resin in order to form a filament arrangement. It should be noted that Futakuchi et al suggested that a filament band was impregnated with a resin material which was thermosetting resin material either in line or the fiber roving was preimpregnated. The reference to Angell and Novak suggested why one skilled in the art would have selected the semi-solid thermosetting resins therein and both heated the same to facilitate impregnation. It should be noted that a roving is not a single filament but rather a plurality of filaments which are assembled together in a tow which is slightly twisted to stay together. It should be noted that the references to Futakuchi et al failed to make mention of the specific width of the roving which was used in the winding operation. It being noted that one skilled in the art would have selected a suitable width fort the fiber roving as a function of the final product being manufactured.

The references to any one of Prochaska et al, Fischer et al, Youngkeit, Matuska or Carrow suggested that those skilled in the art would have known to provide a filament roving and/or band having a width of greater than 0.5 inches for a filament winding operation. More specifically, the reference to Matuska suggested that in a filament winding operation it was known to employ resin impregnated roving having a width between 0.1 to 1.0 inches in width (column 5, lines 31-39 and column 4, lines 40-54). Carrow suggested that it was known to employ a glass fiber band which was impregnated with resin having a width of 0.5 inches in the manufacture of the composite article therein, see column 6, lines 34-40 for the width of the roving band. Fischer et al suggested that a band width of between 0.5 to 2 cm (which is .197 to .787 inches) would have been provided where the filaments were impregnated with resin and utilized in the manufacture of a composite article. The reference to Youngkeit suggested that those skilled in the art would have employed a resin impregnated band having a width of 1 to two inches which the reference states is typical and a function of the article being manufactured, see column 3, lines 59-63. the reference to Prochaska et al suggested that those skilled in the art of filament winding would have employed bands of approximately 2 cm (0.787 inches) in width for the winding operation therein, see column 3, lines 59-63. The applicant is advised that as a function of the final product being produced one skilled in the art would have understood that various width roving would have been useful for the winding operation and such would have typically included roving which were at least 0.5 inches in width as evidenced by any one of Prochaska et al, Fischer et al, Youngkeit, Matuska or Carrow. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a winding band width of at least 0.5 inches as evidenced by any one of Prochaska et al, Fischer et al, Youngkeit, Matuska or Carrow was known in the art as useful in the manufacture of filament wound composite articles from such bands impregnated with resin wherein one skilled in the art would have known that therein employed in the operation included a solventless binder for impregnation of the filaments wherein such included a solid or semi-solid resin which was heated to facilitate impregnation as evidenced by Angell, Jr. and Novak (note that one would have utilized this resin because of its enhanced properties like elimination of solvent during impregnation for example) in the process of winding a perform for a composite article as taught Nishihara and Futakuchi et al.

With respect to claims 2 and 8, note that the references suggested the use of high tack resin in the operation (resins which are semi-solid at room temperature and heated during impregnation and winding are typically of high tack for example and such is taken as conventional for such resin systems. Regarding 4, the references Nishihara and Futakuchi et al suggested the control of the application section (the carriage) in order to vary the angle of the filaments during application. Regarding claim 5, note that the references to Futakuchi et al suggested that those skilled in the art would have impregnated the filaments in line with the filament winding processing. Regarding claim 6, note that the winding processes of Nishihara and Futakuchi suggested that the filament bands would have overlapped one another from one pass to the next. Regarding claim 7, note that the reference suggested that the filament band was impregnated with adequate resin to form a void free end product and thus there clearly would have been adequate resin at the overlaps. With respect to claims 9 and 10, one skilled in the art would have understood that the filament wound component was a perform for the composite component until it was cured and then it becomes the composite component. Additionally, one skilled in the art would have determined the specific needs of the composite article and provided the same with the requisite strength as a function of the loads the assembly was to be placed upon. This is particularly true of Anderson et al whom are making an aircraft component which clearly must satisfy load requirements. It should be noted that the references all desire to employ unidirectional filament tows or rovings and such clearly would not have had "crimping" therein but rather would have been made up of long straight sections therein which were at least three times the length of the width of the winding band. Regarding claim 10, the number of layers applied would have been determined as a function of the article being made and it certainly was commonplace to incorporate 3 or more layers at different angles in a composite component and such is taken as conventional in the art.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 7 further taken with any one of Carter, Underwood, Young, or Hof for the same reasons as expressed in paragraph 4 of the Office action dated 11-14-06.

While the references as set forth above in paragraph 7 suggested the overall operation, they failed to expressly state that one skilled in the art would have incorporated a filament winding operation wherein the impregnation device was part of the carriage arrangement therein (note that Futakuchi et al incorporated an in line impregnation operation in the process of winding therein wherein one skilled would have understood that the carriage would have included the impregnation bath therein). However, those skilled in the art of filament winding would have known to provide for the impregnation of the filaments with the reciprocating carriage for the winding arrangement as such was known per se in the art of filament winding as established by any one of Carter, Young, Underwood or Hof. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a filament impregnation device as part of a carriage in a filament winding device as such was the common manner for filament winding with wet filaments as established by any one of Carter, Young, Underwood or Hof and the processing would have provided for in line impregnation of the filaments therein in the process of making a composite article as set forth above in paragraph 7.

Carter taught the use of a resin bath 27 which was carried on a carriage 8 into which the filament strands 26 from spools 25 were disposed in order to form an impregnated band 28 for winding upon a mandrel. Young taught the use of an impregnation device including the funnel member 45 which was carried by the reciprocating carriage and which was used in the winding of the impregnated filaments upon a mandrel. Underwood taught the use of a bath 22 with an impregnating roll 21 which was used to impregnate filaments to form an impregnated band 24 which was wound upon a mandrel wherein the arrangement was disposed on a carriage 11 which was reciprocated for the winding operation. Hof suggested an impregnation bath 11 through which the filaments pass in order to impregnate the same with resin wherein the trough 11 was disposed upon the reciprocating carriage 7 therein.

9. Claims 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 7 in view of either one of Tucci or Ackley and further taken with McKinney for the same reasons as expressed in paragraph 5 of the Office action dated 11-14-06.

The references as set forth above in paragraph 7 suggested the overall operation including the cutting of the material from the mandrel in the making of the perform. To further evidence that those skilled in the art would have understood in the manufacture of a perform that the material would have been severed from the mandrel subsequent to the winding operation and prior to the molding operation, the references to Tucci and Ackley are cited. More specifically, each one of Tucci, or Ackley suggested that the artisan would have wound multiple layers upon a mandrel followed by severing the wound material from the mandrel and reshaping the composite material subsequent to removal from the mandrel. In this manner, one was able to form a perform preimpregnated ply with reinforcement in the desired local followed by reshaping the same into the desired component (as opposed to making a hollow component via the filament winding operation), these references failed to teach that one skilled in the art would have optimized the local of the reinforcement as a function of the load that the composite component required. Such is recognized in the art as typical of composite manufacture.

To further evidence that one skilled in the art would have performed the same via filament winding wherein plural parts were formed simultaneously, the reference to McKinney is cited. The reference clearly suggested that those skilled in the art would have provided for the application of filaments at varied orientations in order to allow one skilled in the art with the ability to make specific parts on a mandrel which satisfy the load requirements of the finished assembly. It should be noted that that in McKinney there are multiple panels which were fabricated on the mandrel and shaped thereon and then cut from the mandrel. Additionally, the winding angle was designed in order to provide a wing or stabilizer with a specific strength to weight ratio. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the techniques of McKinney in order to design the specific part to be made by controlling the specific winding angles in the process of making a wound perform for a composite article as taught by the references as set forth above in paragraph 7 wherein one skilled in the art was well aware of winding followed by severing to provide a composite ply which was suitable for molding and/or reshaping as evidenced by any one of Tucci, or Ackley.

Note that while McKinney did not teach that the material was severed from the mandrel prior to shaping and curing the material, the reference clearly provided additional shaping prior to removal from the mandrel and the references to Futakuchi et al, Tucci, or Ackley clearly provided for severing prior to shaping.

Response to Arguments

10. Applicant's arguments with respect to claims 1, 4-16 have been considered but are moot in view of the new ground(s) of rejection.

The applicant argues that the prior art failed to teach the specific winding operation as now claimed wherein the winding angle within a single pass was changed n the central region of the winding pass and then returned to the initial angle subsequent to the central windings. The applicant is advised that those skilled in the art would have understood in light of the teachings of Nishihara that those versed in the art would have altered the winding angle within a single winding pass in the manner claimed. It should be noted that the specific meaning of an abrupt wind angle change has not been clearly defined in the specification and the winding in accordance with Nishihara as depicted appears to include an abrupt winding angle change. The applcaint is additionally advised that those skilled in the art would have readily appreciated that the filaments within the band would have been unidirectionally disposed in the assembly and thus "straight" and not crimped.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff H. Aftergut whose telephone number is 571-272-1212. The examiner can normally be reached on Monday-Friday 7:15-345 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jeff H. Aftergut
Primary Examiner
Art Unit 1733

JHA
May 20, 2007